WE CLAIM:

1. A combustor assembly comprising:

a combustor can, said combustor can suitable for use with a scroll; and

a variable penetration dilution jet array positioned in an aft portion of said combustor can there through, said variable penetration dilution jet array capable of providing a dilution air flow such that a pattern factor at an exit plane of said combustor can is reduced and capable of providing a film cooling flow to said scroll.

2. The combustor assembly of claim 1, wherein said variable penetration dilution jet array is positioned in one axial plane of said aft portion.

3. The combustor assembly of claim 1, wherein said variable penetration dilution jet array is positioned in at least two axial planes of said aft portion.

4. The combustor assembly of claim 1, wherein said variable penetration dilution jet array comprises a plurality of scroll cooling openings and a plurality of core penetrating openings.

5. The combustor assembly of claim 4, wherein the diameter of each said scroll cooling opening is between about 0.100 inches and about 0.300 inches diameter.

6. The combustor assembly of claim 4, wherein the diameter of each said core penetrating opening is between about 0.400 inches and about 0.800 inches diameter.

7. The combustor assembly of claim 4, wherein said variable penetration dilution jet array further comprises a plurality of intermediate openings.

8. The combustor assembly of claim 7, wherein the diameter of each said intermediate opening is between about 0.200 inches and about 0.500 inches.

9. The combustor assembly of claim 7, wherein the number of said scroll cooling openings is greater than the number of said intermediate openings.

10. The combustor assembly of claim 1, wherein said variable penetration dilution jet array comprises a plurality of scroll cooling openings positioned in a first axial plane of said aft portion and a plurality of core penetrating openings positioned in a second axial plane of said aft portion.

11. A can and scroll combustor assembly comprising:

a combustor can;

a scroll positioned downstream and in flow communication with said combustor can;

a plurality of scroll cooling openings through said combustor can, said scroll cooling openings capable of providing a film cooling flow to said scroll; and

a plurality of core penetrating openings through said combustor can, said core penetrating openings capable of providing dilution air to a hot gas flow core of said combustor can.

12. The can and scroll combustor assembly of claim 11, wherein said combustor can has a pattern factor at an exit plane, and further comprising a

plurality of intermediate openings through said combustor can, said intermediate openings capable of providing dilution air such that said pattern factor at said exit plane is reduced.

13. The can and scroll combustor assembly of claim 12, wherein the number of said intermediate openings is about equal the number of core penetrating openings.

14. The can and scroll combustor assembly of claim 11, wherein said combustor can is a tapered aft end combustor can.

15. The can and scroll combustor assembly of claim 11, wherein the number of said scroll cooling openings is about twice the number of core penetrating openings.

16. The can and scroll combustor assembly of claim 11, wherein said scroll cooling openings and said core penetrating openings are uniformly circumferentially spaced.

17. The can and scroll combustor assembly of claim 11, wherein said scroll cooling openings and said core penetrating openings are positioned in one axial plane of said combustor can.

18. A variable penetration dilution jet array for an assembly having a can and a scroll comprising:

a plurality of core penetrating openings positioned circumferentially about said can;

a plurality of scroll cooling openings positioned circumferentially about said can, said scroll cooling openings offset from said core penetrating openings; and

a plurality of intermediate openings positioned circumferentially about said can, said intermediate openings offset from said core penetrating openings.

19. The variable penetration dilution jet array of claim 18, wherein said scroll cooling openings are capable of providing a film cooling flow to said scroll.

20. The variable penetration dilution jet array of claim 18, wherein said core penetrating openings are positioned in one axial plane of said can.

21. The variable penetration dilution jet array of claim 18, wherein said intermediate openings are positioned in at least two axial planes of said can.

22. The variable penetration dilution jet array of claim 18, wherein the number of scroll cooling openings is greater than the number core penetrating openings.

23. The variable penetration dilution jet array of claim 18, wherein the diameter of each said scroll cooling opening is between about 0.100 inches and about 0.300 inches, and wherein the diameter of each said core penetrating opening is between about 0.400 inches and about 0.800 inches.

24. A combustor assembly for a turbine engine having a scroll comprising:

a combustor can;

a plurality of core penetrating openings circumferentially positioned about an axial plane of said combustor can, said core penetrating openings uniformly spaced; and

a plurality of scroll cooling openings circumferentially positioned about said axial plane of said combustor, said scroll cooling openings uniformly spaced.

25. The combustor assembly of claim 24, further comprising a plurality of intermediate openings circumferentially positioned about said axial plane of said combustor, said intermediate openings uniformly spaced.

26. The combustor assembly of claim 24, wherein each said core penetrating opening has a diameter between about 0.400 inches and about 0.800 inches.

27. The combustor assembly of claim 24, wherein each said scroll cooling opening has a diameter between about 0.100 inch and about 0.300 inches.

28. An apparatus for a can and scroll combustor assembly comprising:

at least one core penetrating opening through an aft end portion of said can, said core penetrating opening capable of providing dilution air to a hot gas flow core of said can;

at least one scroll cooling opening through said aft end portion of said can, said scroll cooling opening capable of providing a film cooling flow to said scroll; and

at least one intermediate opening through said aft end portion of said can, said intermediate opening capable of reducing temperature variation at the exit plane of said can.

29. The apparatus of claim 28, wherein:

said at least one core penetrating opening is four core penetrating openings each having a diameter between about 0.400 inches and about 0.800 inches;

said at least one scroll cooling opening is eight scroll cooling openings each having a diameter between about 0.100 inch and about 0.300 inches; and

said at least one intermediate opening is four intermediate openings each having a diameter between about 0.200 inches and about 0.500 inches.

30. A method of providing dilution air to a can and scroll assembly comprising the steps of:

projecting a first portion of dilution air through at least one axial plane of said can such that a film cooling flow is provided to said scroll; and

projecting a second portion of dilution air through at least one axial plane of said can such that the temperature of a hot gas flow core of said can is reduced.

31. The method of claim 30, further comprising the step of projecting a third portion of dilution air through at least one axial plane of said can such that a temperature variation at an exit plane of said can is reduced.

32. The method of claim 30, wherein said step of projecting a first portion of dilution air is through at least two axial planes of said can.

33. The method of claim 30, wherein said step of projecting a second portion of dilution air is through at least two axial planes of said can.